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FEEDING THE WORKER

CANTEENS IN INDUSTRY

GOVERNMENT OF INDIA, DEPARTMENT OF FOOD, DEPARTMENT OF LABOUR, NEW DELHI

A message to Industrialists

It has taken a war to make many city-dwellers realise how we all live on the cultivator: The future scope of India's industries and professions depends utterly on better standards of living all round, in which the first essential is more food for the people and their cattle. More and better fodder is needed so that increased bullock-power may bring more lands under the plough, with extended irrigation, better seeds and improved methods of cultivation. Even when more food-grain is produced, we shall not have enough milk to make an adequate diet all round unless we have more fodder. Only the Man in the Field can do the job for us all, but he needs all the help he can get.

HOWEVER INDIRECT YOUR CONNECTION WITH THE CULTIVATOR, PASS THIS MESSAGE ON

INDUSTRIALISTS!

Grow more FOOD

in your waste areas

BUILD INDIA'S HOME AND PEACE FRONT

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"Not all of us realise the hard work and attention to detail that good catering demands, how the way a meal is cooked and served is as important as the food itself and how all those who labour at the sink or keep the floors of messes and cook-houses clean contribute to our comfort both inside and out."

Air Commandant Lady Welsh, Director, Women's Auxiliary Air Force.

POLICY OF THE GOVERNMENT OF INDIA

*NOTE.—*It is the policy of the Government of India to encourage cooked "balanced" MEALS, in preference to only Tea and Coffee Canteens.*

The Necessity for continuing FOOD CONTROL AND RATIONING During the Post-war Period.

1. The principal causes for the necessity to introduce food control and rationing in India in 1942-43 were rapid increases in prices, shortage of supplies, increased demand and dislocation of transport facilities.

2. The chief reasons given for the necessity of introducing food rationing in early 1943 were as follows:—

I. OBJECTS:—The object of Food rationing is not primarily to reduce consumption, but to distribute short supplies in an equitable manner. When supplies are ample and assured as in "Surplus" Provinces and States,—the control of consumption is necessary for the effective mobilization of resources for total war purposes; but when supplies are short and irregular, a closely controlled rationing scheme is even more necessary to ensure a fair distribution to all.

II. RATIONING AND PRICE CONTROL:—Food Rationing must go hand in hand with price control; each helps the other. No price control can withstand, unaided, the pressure of increasing demand on dwindling supplies, and it must be accompanied by quantitative control over demand and supply. Equally, rationing requires price control. Since no matter, how widespread rationing is, it will not ensure equitable distribution among all income groups unless prices are low enough to enable every one to buy his ration.

III. SUPPLY AND DISTRIBUTION:—The distribution of foodstuffs by rationing must be carefully coordinated with the supply position, and its planning supported by an accurate statistical "balance sheet"adjusted weekly. Both in supply and distribution, wholesale and retail traders should be used, under Government licence, and supervision, to carry out the operations as Government Agents. But in case the method of working through trade proves to be impossible, an alternative scheme to be operated entirely by official agency, must be ready to take its place at short notice. There is no reason why distribution through efficiently run Government grain shops as well as through licensed retailers should not continue simultaneously.

IV. URBAN AND INDUSTRIAL AREAS:—Since the population of all large cities,—especially those situated on the coastline—are unable to grow food, but are usually occupied in manufacturing the material needs of the countryside, each set of the community is helpless without the aid of the other.

V. SECURITY AND CONFIDENCE:—When an efficient food control scheme is in operation, it is not only the population that feels a sense of security, and confidence, but the Authority itself, because it is the possessor of an "instrument" that can be made to cover several other forms of "Consumer" goods control, other than food.

VI. "GREGORY" REPORT:—The relative paragraphs in the "Gregory" Report are reproduced below:—

Report of the Foodgrains Policy Committee.

	PAGE
1. "It is not possible, at the present time, to secure a fair distribution without a limitation of the individual's right to purchase,—and that involves rationing".	IV
2. "The most important practical aspect of the distributive problem at the present time is the rationing of the larger cities of India".	VI
3. "The food problem of India is one, and no section of the population must be neglected".	62
Attention is also drawn to those special pages in the "Gregory" Report, i.e., pages 66 to 80.	

VII. WORLD POSITION:—It is reasonable to assume that since the eyes of the World are on India's food situation, the amount of practical help in the form of shipments of grain will be governed by the amount of efficient food control organisation initiated and maintained by the Provinces and States. The United Nations could not carry on their War Effort without rationing, therefore, they will judge the food control administration of India by the rationing schemes inaugurated or neglected.

VIII. LOOKING AHEAD:—The inauguration of Food Control and Food Rationing in time of War, might conceivably mark the beginning of a new era of nutritional feeding, equitable distribution, and a more satisfactory price structure for everyone concerned, in the days of Peace.

3. The conditions prevailing in India during the immediate post-war period will not differ to any appreciable extent to the War Period, in fact, of the reasons given in para 2 above, each one of them is applicable today and will probably be applicable for some time to come.

4. Further emphasis should be made in regard to No. vii, i.e., the World Position relating to FOOD generally,—especially food grains,—and the increasing demands from all liberated territories. There is no indication that imports into India of rice from Burma will be made for many months to come.

5. From information received from time to time from various parts of the country the masses welcome rationing, but there is no doubt that if rationing is to continue, a vigorous campaign will have to be inaugurated to clear some rationing organisations of the persistent charges of bribery, inefficiency, corruption, poor quality food grains and lack of service to the consumer.

6. Food Control and Rationing Schemes will therefore have to remain

(*Contd. on page* 9)

FEEDING THE YOUNG WORKER

It is probable that more and more of India's young men and women will enter the industrial field in post war years. It is of vital importance then that these young workers should not only be fed but fed well.

It is necessary to dispose of the illusion that young people require less nourishment than adults. From the complications of wartime shopping and rationing of essential foods no civilian is exempt, but their consequences are most serious to the community when they affect the quality, quantity, and regularity of young people's meals.

Sir Edward Mellanby, Secretary of the Medical Research Council has declared "Much of industrial ill-health is undoubtedly due to mal-nutrition, not now, but during infancy and early life and adolescence." Canteen meals for young workers not only help to ward off illness that arise from under-nourishment; they are an insurance against future break-down.

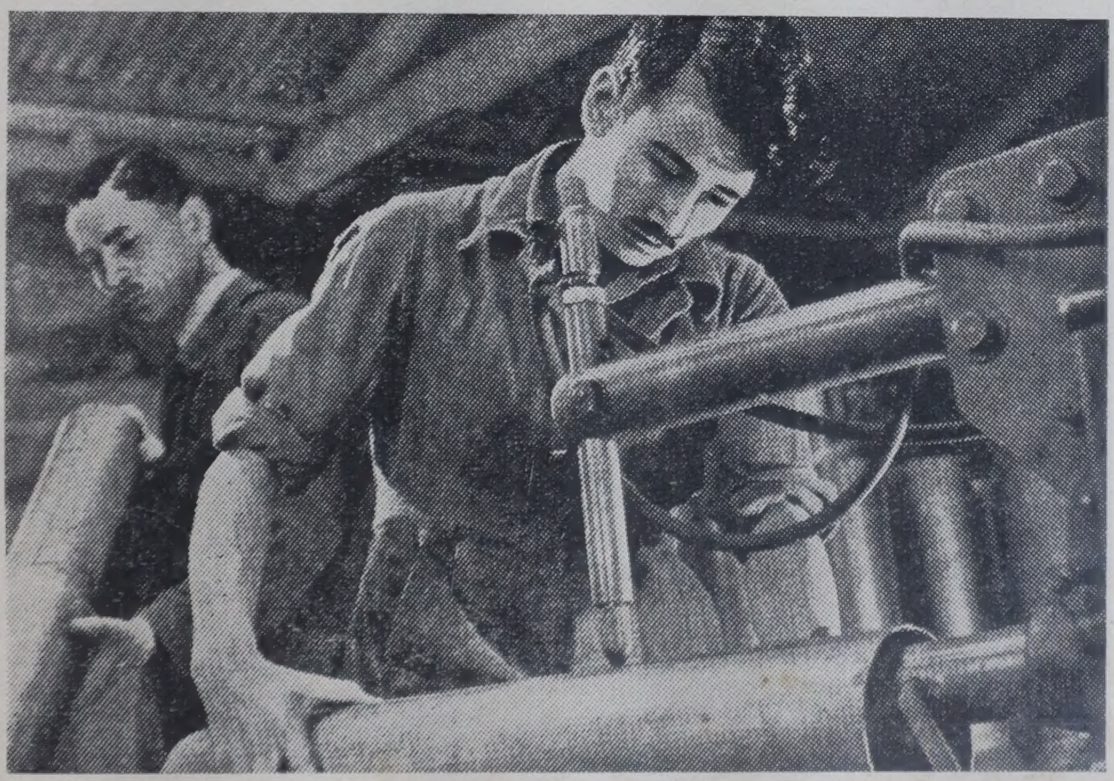
The Labour, Food, and Health Departments are engaged in research into youth problems with a view to ameliorative action as a logical corollary to school feeding schemes. It is imperative that the special needs of the adolescent should be appreciated not only by factory managements, but by the young workers themselves. Mr. Ernest Bevin, U. K. Minister of Labour and National Service, addressing a conference on Industrial

Health held in April, 1943, said, "Good food during working hours can be of enormous benefit and it should not be treated as a 'side-show' or something that has been imposed on industry. We want to see managements treating the provision of food as just as much an essential part of the factory organisation as the costing department or any other, and acting accordingly." It is not enough that the young worker does a man's job. He also needs a man's food and good food at that. It is not enough that food should *be* right; it must also *look* right. The addition of fresh vegetables to the main meal is important for growing youngsters owing to certain Vitamin deficiencies in feeding—particularly Vitamin 'C'.

A pleasant scene and a cheerful atmosphere are inducements as strong as an attractive menu. The Canteen is a place where the workers relax and are 'restored', and from which good fellowship should radiate. Where practicable a games-room and library will be strong incentives to the community spirit.

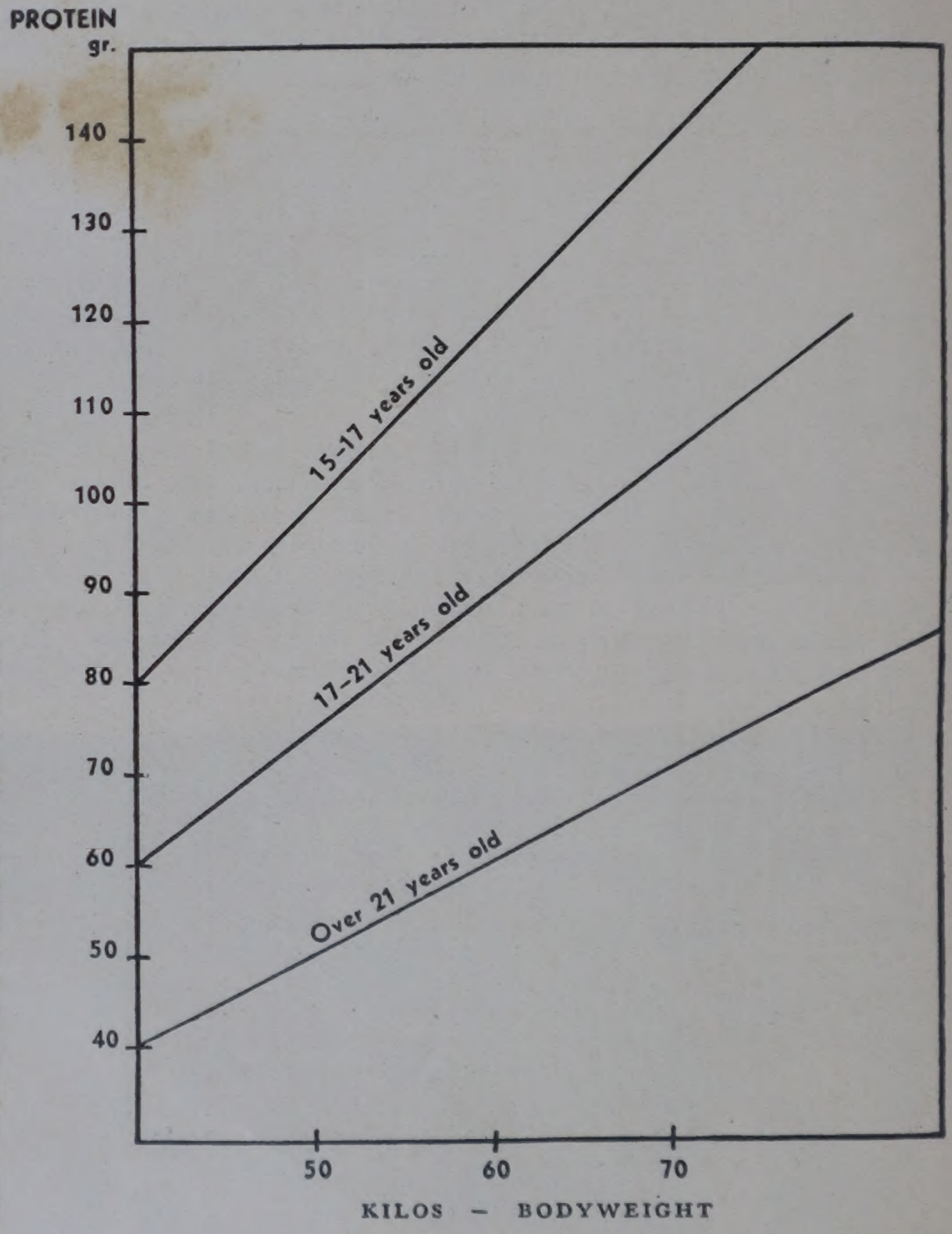
It is essential to enlist the co-operation of the young workers themselves when a system for the feeding of young workers in an industrial organization is introduced. There is little doubt that a confident and stimulating appeal, backed by competent organization is almost sure to meet with an encouraging response.

The newcomer to the factory—the youngster full of hope and ambition—if he is wise, and is helped to be wise, should soon discover that the brightest spot of all is the canteen. Here he will eat a good square meal every day and work the better for it—and play the better for it, too. But he will have found something more than a feeding place; a social centre, a place in which to meet friends and to make friends, in which to feel at one with the corporate spirit of the factory and of that wider society of which a well-run factory may be the nucleus.



PROTEIN REQUIREMENTS

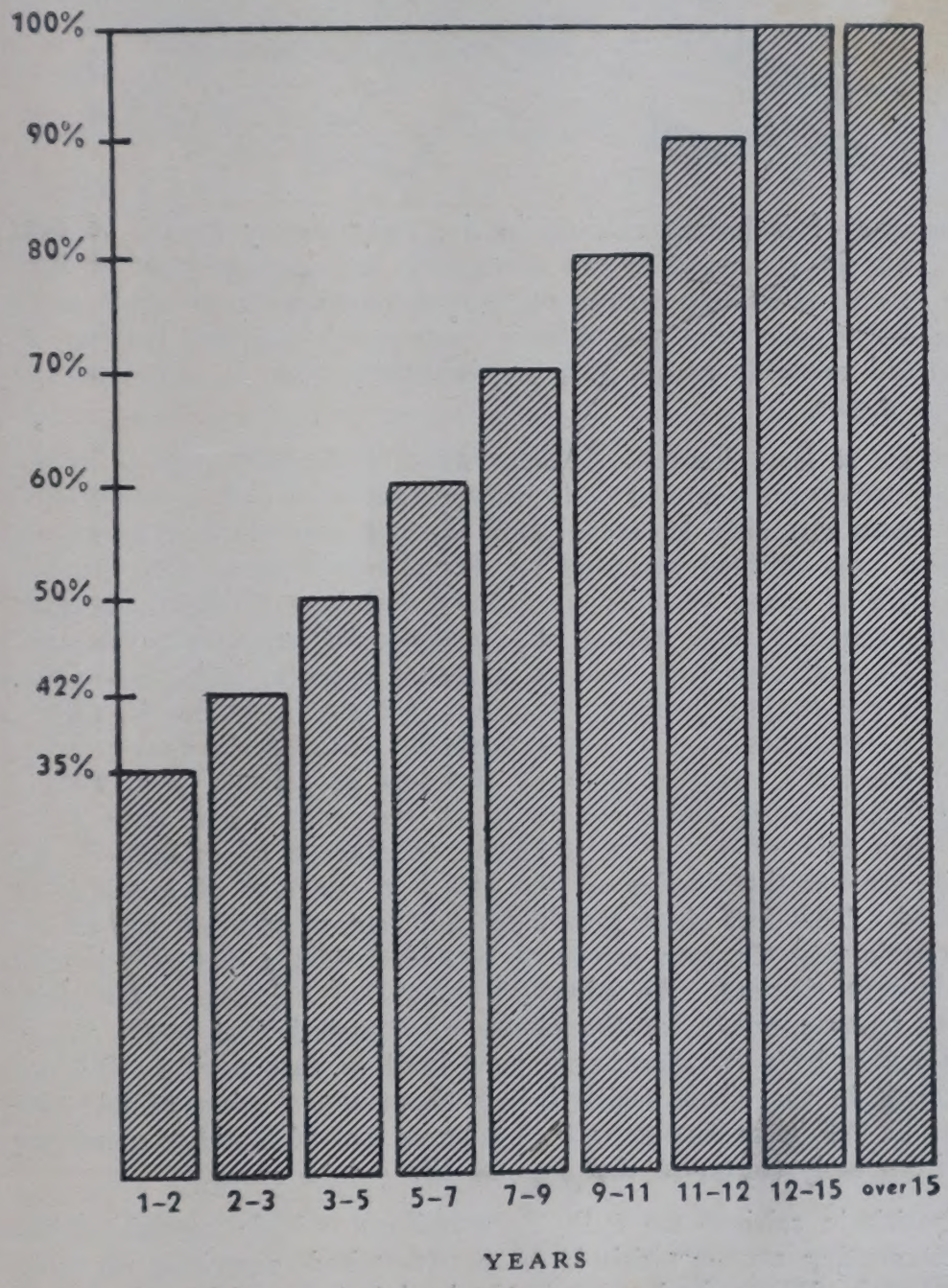
The protein intake for all adults should not fall below 1 gramme per kilogramme of body-weight. This is roughly equivalent to ¼ oz per stone body-weight. During the growing period a large proportion of the total protein should be of animal origin.



WITH ACKNOWLEDGEMENTS TO

CALORIE REQUIREMENTS

An allowance of 2,400 calories net per day is considered adequate for an adult, male or female, living an ordinary everyday life in a temperate climate and not engaged in manual work. 600 calories per day may be taken as an average supplement for muscular work. It is suggested that the activities of boys from 11–15 years of age be considered as equivalent to moderate work, and of girls from 11-15 upwards as light work.



THE EMPIRE TEA BUREAU LONDON

The importance of including calcium in the daily dietary cannot be over stressed. This, of course, does not imply that the metallic base of lime should be spoon-fed to long queues of reluctant workers, but it does mean that those individuals who are directly responsible for the feeding of workers should earnestly ensure that this invaluable item is amply present in prepared dishes.

There are at least fourteen different mineral elements present in the human body which are depleted daily through the skin, kidney and bowels and these losses can only be made good through the medium of appropriate foods. An eminent authority on dietetics informs us that the two most important of these minerals are calcium and iron which, if supplied in adequate amounts, will ensure the presence of remaining recondite elements. We will deal with iron on a future occasion and confine this discussion to the subject heading. Calcium, we are informed, is needed for the bony structures of the human make-up such as the bones themselves and the teeth. A diet seriously deficient in calcium will, over a period, definitely bring about the decay of the teeth. But, even more important than this, especially in accidents, an absence of calcium in the system will prevent the clotting of the blood in the case of a minor or major wound. This fact alone should be sufficient to spur all our efforts to make certain that the men are being provided with a diet rich in this vitally important element. An adequate amount of calcium in the daily dietary may be responsible for the saving of human life at works where those responsible have conscientiously paid heed to this advice. Calcium is the element in the blood which brings about the clotting of an open wound and its deficiency may cause such a heavy loss of blood to a casualty removed from early treatment that loss of life would ensue.

Foods rich in calcium are milk, eggs and green leafy vegetables, but there is yet another source which is often overlooked, especially by cookhouse personnel. When fresh meat is obtained it is invariably "bone-in", but what happens to the bones? The point is:— How often DO those bones find their way into the stockpot? To satisfactorily extract their

abundant calcium content, vinegar should be added in the following ratio:—40 lbs. Bones: 4 Gals. of water and half pint of vinegar. Bones should be sawn to 4" lengths. At this juncture a well-known cry is anticipated: But who wants hot soup in this climate?" Has anyone ever thought of trying COLD soup? It may not be possible to ice it or to add gelatin in order to produce a first class "Consomme double en taste" but providing that it is cold and thoroughly strained, its presence on the Servery at Tiffin time will prove its own popularity. A few words to the men explaining the motive for its inclusion in the menu would prove invaluable at the mess meetings. Unlike hot soups it lends itself to consumption from a cup, and not only is it refreshing and sustaining but it ensures that an adequate supply of calcium is provided daily even when other sources of this essential mineral salt are not available to us.

FOOD CONTROL AND RATIONING (*Contd. from Page 3*)

in force until sufficient time has elapsed that will enable the Central Government to complete a survey of the overall food position in India, in relation to the world position of food supplies and requirements.

7. The existing rationing organisations can be—and are being used for several other purposes in addition to rationing of food grains and sugar, —such as the handling of protective foods, milk schemes, community feeding schemes, etc.,—they are also being used for fuel, kerosene and cloth rationing,—none of which commodities is likely to be in abundance for some time.

8. Emphasis must be laid on the effect of the post-war conditions on Food Control and Rationing in the U.K., continental countries, Canada, Australia, New Zealand and the U.S.A.

All these countries,—after the cessation of war with Germany have had to introduce food rationing, or reduce the rationed quantities of certain essential foods or tighten up considerably the existing regulations. India must be on guard until the food situation is clear and safe.

Further, it is reasonable to assume that if India abandoned or relaxed the existing rationing schemes, those overseas countries now shipping wheat and wheat products to India would not be obliged to do so.

In view of the very bad food conditions recently discovered in Europe, there is every possibility that the Eastern and the Far Eastern food conditions will be worse, which must have repercussions on India.

9. From the offtake statistics continuously compiled by all Provinces and States, there does not appear to be any reason why the present size of the rations now in existence should be increased, since the full amount is not being purchased by the masses.

10. The Department of Food is maintaining the closest touch with all rationing Authorities through their Regional Food Commissioners in order to make quite sure that any hardships to the people are eliminated, and also to plan the relaxation—and ultimate abolition, of food rationing at some unpredictable date,—possibly 2 to 3 years, although in 12 months' time it should be possible to give a more accurate estimate.

"ENEMIES" IN THE COOKHOUSE

There is an ever-present danger in the cookhouse of contamination of food by germs-toxin-producing bacteria which causes outbreaks of food poisoning, and bacilli which causes outbreaks of diseases such as typhoid fever and dysentery. These are your enemies : "The enemies in the cookhouse." How do they work and how to combat them ?

"Where there is dirt there is danger" is a slogan applicable to all conditions of life and especially when applied to food production. Cleanliness of the cookhouse and personal hygiene of the staff are therefore of momentous importance, but unfortunately germs can and do exist in apparently clean conditions. Hands, for instance, that have an appearance of cleanliness, can be actually seething with germs. The problem is surrounded with many difficulties and the following is an endeavour to explain and overcome some of them.

FOOD—NOT POISON!

It is necessary to give an explanation of what takes place to make food so harmful as to cause extensive occurrences of poisoning. A large proportion of epidemics have been due to the presence of bacterial toxins or poisons, and the question naturally arises—how do the toxins get into food ? They are certainly not directly introduced. They are manufactured in the food and the manufacturers are bacteria or germs introduced into it by one of the following methods :—

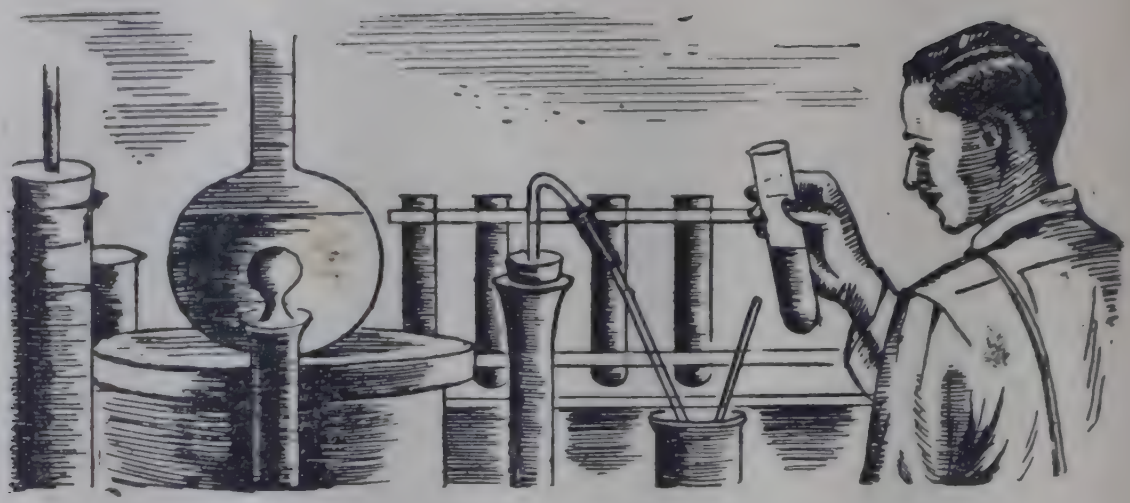
1. Personnel engaged in preparation suffering from infections such as colds, septic sores, sore throat, diarrhoea, and germ infected hands.
2. Dirty cooking utensils and cooks' clothing.
3. Food after preparation being allowed to remain uncooked and uncovered for lengthy periods.
4. Failing to inspect all material to be sure that it is sound, as in the case of pies. One small bad piece of meat would infect a considerable amount of good meat in the process of cooking.
5. Water, of which naturally large quantities are used for many purposes, can be polluted without any outward evidence, and should there be any doubt as to its purity, advice should be obtained from the Health Officer.
6. Flies and vermin live largely in the midst of dirt and consequently carry about with them large numbers of germs. Food therefore should be kept covered and protected from these pests.

HOW GERMS ARE GROWN

When a scientist in his laboratory is growing germs, in test tubes, he has to provide them with food. One important constituent of their diet is meat extract. When bacteria are fed they grow and as part of the process of living, some of them produce toxins, or poisons. When toxin producing bacteria are introduced by the hands of cooks into foods such as rissoles, the number introduced may be very small and if the food is cooked and eaten at once, no harm may result. If, however, the food is left for a period and temperature and conditions are favourable, these germs will multiply rapidly. They find in the rissole almost as good food as the bacteriologists would provide them in his laboratory and they produce toxins in considerable amount. Eventually, when the food is eaten, there is enough poison in it to cause a severe attack of gastro-enteritis. This manifests itself in an attack of diarrhoea, vomiting and severe belly pain. If the poisoning is severe the victim becomes weak and collapses and has a high temperature. Naturally when a lot of people are involved the situation is alarming.

In these days so many have meals in large messes, canteens and restaurants, a large number may be involved in such an outbreak. When this is extensive, not only is the situation alarming, but there is also great interference with work since it takes some time for the poisoned to recover. It is of the greatest importance, therefore, to do all that is possible to prevent these outbreaks. The above has been written so that those who work in the kitchen will realise how good food may be made dangerous during its preparation. It is hoped that with this understanding, those responsible for the production of meals will increase their efforts to prevent food being contaminated. After, all, the aim is to send from the cookhouse to the Dining Room 'Food, not Poison !'

The dangers and difficulties increase a hundred fold in tropical countries. In addition to cases similar to those described, there are tropical and sub-tropical diseases threatening through the medium of food. The danger and its prevention is literally in your hands. Take precautions and above all insist that cooks wash their hands in a strong potassium permanganate solution every time they leave and return to the cookhouse.



THE SCIENCE OF NUTRITION No. 2

PREFACE: This series of articles on Nutrition is based on lectures and other material prepared for the instruction of Welfare and Nutrition Workers in Industry, by the Ministry of Food. In most of the large industrial organizations in India, there are members of the staff with scientific qualifications who might wish to take an interest and become instructors in the science of Nutrition, details of which will appear in the series of articles mentioned above.

CHAPTER 3.

FATS

The substances which are defined under the classification of fats include all fatty materials including the fat from meat, butter fat and all the oils derived either from animal or vegetable sources.

1. Fuel for energy can be stored in plants as starch. It can, however, also be stored, and stored in its most compact form as far as living things are concerned, in the form of *fat.* Fat is, therefore, *the most concentrated of all energy foods.*

2. Fats are not soluble in water. The property by which they are most readily distinguished from other components of food is that they will dissolve in such liquids as petrol, chloroform or ether. These liquids, in fact, are often called *fat-solvents.* Fat-solvents, like fats themselves, will not mix with water.

3. *All common fats possess almost the same value as food.* Some natural fats contain other nutrients mixed with them but, so far as the fats themselves are concerned, their values may be taken to be equal.

4. The physical qualities of different fats differ principally because *certain of them become liquid at a lower temperature than others.* Oils are merely fats which remain liquid at ordinary atmospheric temperatures. If oils are cooled they become solid.

5. *In plants,* fats are formed from carbohydrate. When seeds, such as cottonseed or linseed, ripen, the amount of starch in them falls as the fat

increases. *Oil seeds* such as these are among the most important sources of fat for the manufacture of margarine or other purposes.

6. *In animals,* like plants, fat may also be formed from carbohydrate. If an individual eats more starchy food than is needed for the physical work to be done, fat will be laid down in the body. *Similarly,* pigs can be fattened on food largely composed of carbohydrate. Besides being capable of forming fat from carbohydrate, however, animals can deposit in their bodies some of the fat from their food. If a pig is given large amounts of cod-liver oil, its own body-fat will soon taste of cod-liver oil.

7. When fats are treated with alkali, for example, soda, they become split into *glycerol* and *soap.* Since both of these are soluble in water, fat can by this treatment be made to dissolve in water. The process of splitting fats into glycerol and soap is called *saponification.*

All fats and oils which are useful to the body as food can be saponified. Mineral oils, such as liquid paraffin, or greases, such as vaseline, *cannot be saponified.* They are, therefore, unavailable to the body for the production of energy and do not qualify to be classified as food.

FOODS PROVIDING FAT IN THE DIET

	FAT	
	g. per oz.	per cent.
Frying oil (olive oil, cottonseed oil, etc.) ..	28.4	99.9
Lard, dripping	28.1	99.0
Butter, Margarine	24.2	85.3
Brazil	17.3	62
Almonds	15.2	54
Peanuts	13.9	50
Cocoanuts	10.2	36
Bacon	12.1	43
Cheese	9.6	34
Mutton	8.7	31
Beef	4-8	14-28
Herring	3.8	14
Egg	2.9	10
Salmon	2.7	10
Milk	1.0	4

(i) Oils and fats like cooking oil and dripping are almost 100% fat. Butter is a mixture of *butter fat* from milk, and water. It also contains a proportion of salt and certain other nutrients. (ii) The figures for the amount of fat in beef and mutton given above are averages. It is a commonplace that meat may vary very widely in fatness depending on the way the animal it came from was fed. (iii) Fish, such as herrings, mackerel, salmon and eel, are some times called *fat fish.* The amount of fat in them

however, depends on the sexual development of the fish and is greater at one period of the year than another. *White fish,* which include cod, whiting, haddock and sole, contain very little fat. (iv) Most of the common vegetables and fruits contain almost no fat at all. The amount in flour and other cereal products is small, except in the case of oatmeal which contains 2.3 g. of fat per oz. (8%).

THE CHEMICAL NATURE OF FATS

Chemically, fats are made up of three *fatty acid* units combined with a single unit of *glycerol.* In the process of saponification, which has already been described, these fatty acids become combined with the alkali to form *soaps* and the glycerol remains free.

A large number of fatty acids are known to exist. These differ from one another. The difference between one fat and another are due to the different fatty acids in each. For example :

1. The distinctive flavour of butter is principally due to the presence of *butyric* acid in its composition. Butyric acid has a strong and unpleasant smell. When butter becomes *rancid* some of the butyric acid breaks off from the butter-fat to which it was attached and thus gives rise to the smell of rancidity.

2. *Caprylic acid* is one of the fatty acids in coconut oil, in *butter* made from cow's or goat's milk, and in *human fat.* Caprylic acid is one of the substances which give to goats etc. their smell. (Caprylic—caper —a goat. Latin).

3. *Palmitic* and *stearic* acids are present in almost all fats. They are the most frequently found in *solid fats.*

4. *Oleic acid* is almost very widespread. This fatty acid is present in largest amounts in *liquid oils.*

The unbroken fat, in which the fatty acids are chemically combined with glycerol is not soluble in water but is soluble in *fat solvents* such as ether. When the fat is split up by saponification, the bulk of it in the form of free glycerol and free fatty acids, or soaps of fatty acids, becomes water-soluble. In all natural fats, however, a small residue remains unsaponified. This *unsaponifiable* residue contains a mixture of substances some of which may be of nutritional importance. If a fat contains vitamins, they will remain in the unsaponifiable residue.

CHAPTER 4

PROTEINS

Proteins are substances which are essential constituents of plant and animal cells. There is no known life without them. In animals the muscular tissues of the body is composed of protein. It consequently follows that protein is needed in nutrition for the growth and repair of the human body. The muscular tissue of the body of animals, that is to say, lean meat, is also composed of protein and serves, therefore, to provide one source of protein as a nutrient in the human diet.

Just as plants can build up carbohydrate, and hence derive energy, from inorganic substances present in the soil and the air so can they also form their own protein from inorganic materials. Animals cannot do this. They can, however, use for food for the construction of their own bodies the protein from plants.

There are, therefore, two sources of protein for nutrition :

1 ANIMAL PROTEIN

Animal protein forms a constituent of :

1. *Meat of all kinds.* 2. *Game, poultry, etc.*
3. *Fish of all kinds including shellfish.*
4. *Milk, dried milk, condensed milk, etc.*
5. *Cheese.* 6. *Eggs.*

2 VEGETABLE PROTEIN

Protein forms part of all living plant cells. There is, therefore, a proportion of protein in *green vegetables* although the amount is small. Since *root vegetables* contain a high proportion of water, their protein content is also low. Potatoes, however, contain more protein than turnips or carrots. Among seeds, the proportion of protein is highest in *peas* and *beans*. The figure for *dried* peas and beans is highest of all but this value may be misleading when human nutrition is in question because it becomes several times lower when the peas are soaked. *Nuts* may perhaps be grouped with other seeds. They contain amounts of protein similar to those present in peas and beans. As nuts are, however, eaten dry they may be considered to rank higher.

The most important class of seeds used for food are cereals. In a grain of cereal, such as wheat, the most active living cells are in the embryo from which the new plant will in due course develop. The largest proportion of the actual grain is, however, the stored starch upon which the plant itself depends until it has grown leaves, and which makes it attractive to man as a source of human food. This part of the grain contains less protein than the parts associated with the embryo. It consequently follows that while the whole grain contains useful amounts of protein, the more completely the parts associated with the embryo are removed in the process of milling flour, the lower will the proportion of protein become. Thus brown flour contains less protein than the wheat from which it is made, and white flour contains less protein than brown flour.

THE USES OF PROTEIN IN THE BODY

Protein from the diet is used for two main purposes :—

1. *For the growth and repair of the body.*
2. *For the production of heat or other forms of energy.*

THE USE OF PROTEIN FOR GROWTH AND REPAIR

The protein structure of which the human body is made is not the same as that found in plants. Although it is similar to that found in animals it is not identical with that either.

If the protein in the diet is derived from *vegetable sources* a variety of foods must be eaten and quite large amounts taken so that the body may have the opportunity of taking to pieces the various vegetable proteins to find sufficient ingredients to put some parts of them together again as human muscle.

If the protein in the food is derived from *animal sources,* less will be needed since the degree of difference between animal protein and human protein is less than that between vegetable protein and human protein.

If protein is derived from a *mixture* of animal and vegetable sources, the amounts required may be as little as if it all came from animal foods, since the variety of protein available to the body may enable it to put together human protein economically.

Children who are growing and women who are *pregnant* or *nursing* obviously need proportionally more protein in their food, since the protein is needed for growth, than normal adults who need it for repair and maintenance only. *A certain amount of protein is, however, essential for everybody.*

THE USE OF PROTEIN AS A SOURCE OF ENERGY

Since under normal circumstances the amount and kinds of protein present in the food will not *exactly* fit together to provide what is needed for growth and repair only, there will usually be a proportion of spare protein material. This is used for the production of energy or heat. Indeed, *protein is equally useful for providing energy for the body as carbohydrate.*

FOODS PROVIDING PROTEIN IN THE DIET

Animal protein	g. per oz.	*Vegetable protein*	g. per oz.
Cheese	7.2	Peanuts	7.2
Corned beef	7.0	Wholemeal flour	4.3
Beef	4.0–5.2	White flour	3.1
Mutton	3.8	Beans (baked)	1.6
Egg	3.6	Peas (green)	1.6
Milk	0.9	Potato	0.6
		Spinach	0.5
		Cabbage	0.3
		Carrot, turnip	0.3

THE COMPOSITION OF PROTEIN

Just as starch is composed of a number of glucose units linked together, so also are proteins made up of a number of *amino acid* units. In the case of starch, however, all the glucose units are the same, whereas there may be *more than twenty different kinds* of amino acid in a single protein.

Proteins differ from one another because of the different kind and

different arrangement of amino acids in them. Thus it comes about that whereas purified rice starch, potato starch and corn starch are all very similar, since they are all composed of glucose units, beef protein. bean protein and cheese protein are by no means similar since the arrangements and kinds of amino acids in them are different.

The human body can convert many of the amino acids it does not need for its own structure into others that it does. There are, however, *ten amino acids* which the body cannot make and which must therefore, be supplied in the diet. These ten are called *essential amino acids.*

Proteins from different foods can be graded depending on whether or not they contain all ten of the essential amino acids in *sufficient quantity* to satisfy the needs of the body.

In general, it can be said that *animal proteins* usually contain the essential amino acids in proportions reasonably appropriate for human needs, while *vegetable proteins* may be lacking in one or other of them. For this reason animal proteins are often called *first class protein* and vegetable protein *second class protein.* There are, however, exceptions to the superiority of animal over vegetable protein, and to the "completeness" or "incompleteness" of either.

Gelatin, which is an animal protein derived from meat and is the principal ingredient in gristle, hoofs, horn, etc., is completely deficient in at least one essential amino acid, *tryptophane.* Gelatin has, therefore, little value as food unless supplemented by other protein.

On the other hand, certain of the proteins in cereal grains, soya beans and Brazil nuts contain all ten essential amino acids.

PROPERTIES OF PROTEINS

1. *Some proteins will dissolve in water.* An example is *egg albumen* (the white of an egg). This protein coagulates on heating.

2. *Most proteins do not dissolve in water.* Many common food proteins are, however, soluble in *salt and water mixtures* of various strengths.

3. When proteins are heated strongly, or treated drastically in other ways, they become *denatured.* This is usually accompanied by hardening to varying degrees.

(To be continued).

Additional copies of this brochure will be sent upon application — provided stocks are not exhausted; early application is necessary.

All communications regarding this brochure should be made to
The Editor
"Canteens in Industry,"
C/o Dept. of Food,
New Delhi.

THE CORNER-STONES OF GOOD MESSING

FACILITIES

Without adequate facilities even the experienced cook encounters much difficulty in performing his duties satisfactorily. However, the service cook knows the need for his resourcefulness and always improvises when existing equipment prevents him from doing full justice to the daily ration issues. Many of the difficulties experienced in the past in this respect could be removed by the installation of modernly designed and well equipped kitchens, plans for which will appear in these Bulletins. Until such time as the new cookhouses are erected, however, it is well to reflect upon some of the difficulties with which cooks are faced in the existing old-type kitchens still in use in certain canteens.

SMOKE

The cook who has worked in a smoky kitchen knows only too well the discomfort of streaming eyes and semi-asphyxiation. It is quite impossible for any cook to give of his best under these conditions, which are invariably caused by faultily designed and constructed chullas, etc.

If your kitchen is smoky then find out why, and remedy the cause.

HOT WATER

Without an adequate and constant supply of hot water a cook is bound to fall down on his job. Apart from actual cooking, hot water is essential for making beverages and for washing cooking utensils. It is also abundantly required for scrubbing down benches, shelves and floor spaces. In the kitchen, suitable sized degchies are useful. Salamanders are good, too, but they need careful handling otherwise they tend to spring a leak. A really good boiler can be constructed on the lines of the old fashioned domestic "Copper" (clothes boiler). Copper or tinned brass linings can usually be purchased quite cheaply in the local bazaar, and the structure for the boiler should be erected with bricks and a final surface of concrete. These boilers are not difficult to build once the linings have been obtained, and a row of them will prove invaluable for providing constant supplies of hot water. They may be used for cooking stews, vegetables, suet puddings, and even for deep frying. For chimneys 6 lb. Bully tins can be fashioned so as to produce an effective flue. A point well worthy of note is that the firebox should be so constructed that flames reach as large an area of the boiler base and sides as possible—this will greatly reduce fuel consumption.

OVENS

Where existing ovens are inadequate or, worse still do not exist at all, improvisation is really very important. The most important factor in obtaining satisfactory results from an improvised oven is to construct it in such a manner that heat is forced to take a circulatory path on its way up into the chimney. This ensures that the entire area of the oil-drum or boiler has a fairly equal distribution of heat, without which, bottom heat will be obtained, and this results in partly burned and partly uncooked food.

IMPROVISED BAKING OVEN

Build a kettle trench about 9 inches wide and the maximum length should be not more than 8 feet. The height should be approximately one foot. The trench could be cut into the ground but the fire is afforded a much better draught if instead of cutting the trench it is built up with walls of earth-filled petrol tins, bricks or stones. When the fire is in good condition and is reduced to glowing embers, place large degchies across the trench and put the foods to be baked into them. Place the lids on firmly and cover each degchie with glowing embers. This improvised oven can even turn out a souffle, so its performance for less ambitious purposes can be gauged with justifiable optimism.

FLIES

Apart from the danger to health, nothing is more exasperating than the

annoyance caused by flies in the cookhouse. Every cookhouse has its own Goliath and David to say nothing of their progeny.

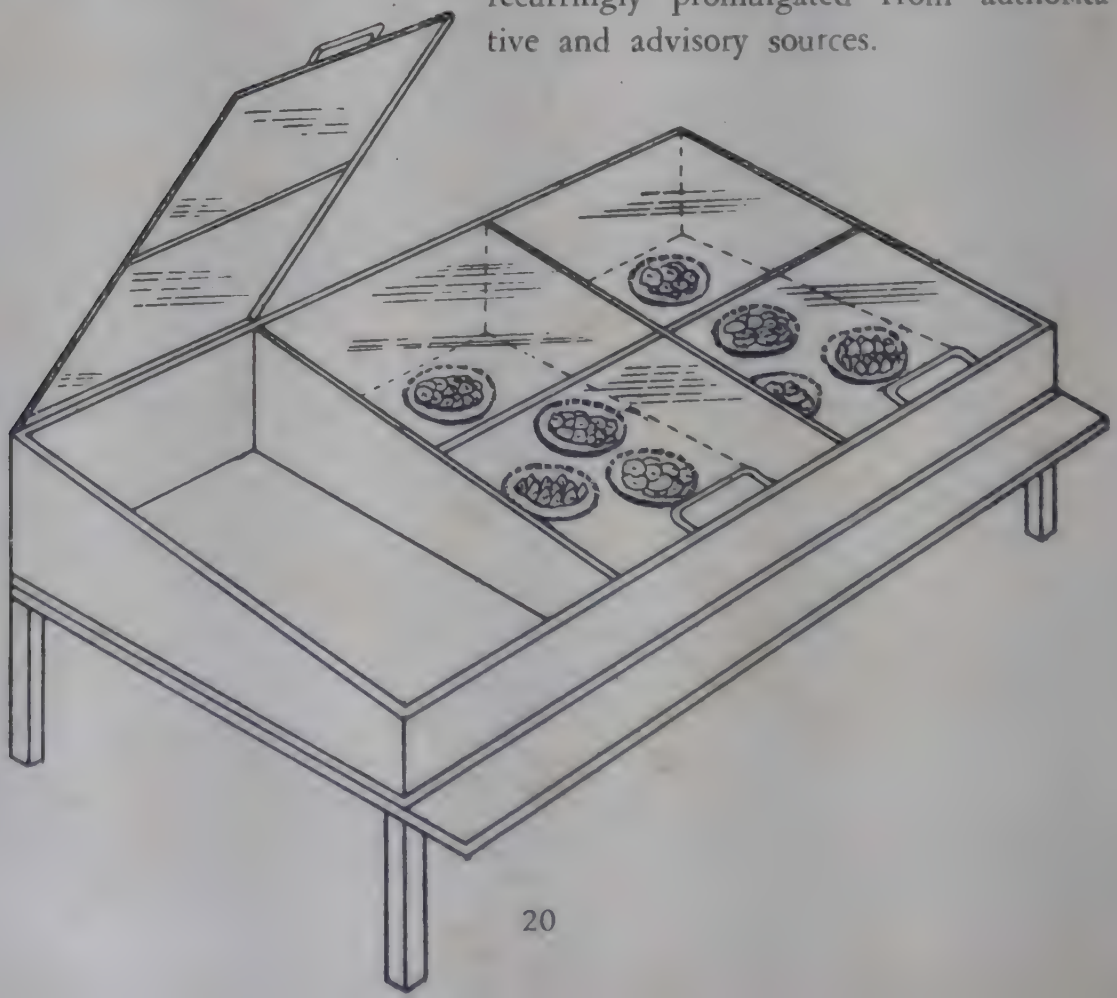
Doors and windows should be fly-proofed with wire gauze. However, even a well fly-proofed kitchen will be subject to a continual invasion of flies unless the outer doors are kept closed. If the doors in the cookhouse lack spring-back attachments then this can be remedied with a weight and a length of cord for each door.

FLY-PROOFED FOOD CASES

In order to reduce still further the incidence of food contamination by flies, it is advisable to take immediate steps to protect foodstuffs which are placed on counters or serveries by introducing fly-proofed food cases. The accompanying diagrams illustrate a very suitable type of food case and is one which will prove both inexpensive and simple to construct.

Fly-borne diseases continue to exact their toll of victims and the Industrial Employers must do everything within their power to protect their workmen from such infections.

The possibilities of transmitting dysentery through the medium of food must be constantly borne in mind by all service personnel of the Catering section. When cases of sickness are traced to food contamination this is invariably due to negligence in observing the hygienic principles recurringly promulgated from authoritative and advisory sources.



FOOD is
the weapon of victory
and PEACE
USE IT TO THE
BEST ADVANTAGE

Safeguards to

Too much cannot be said concerning the necessity for perpetual warfare against the most potent enemy in our midst—DIRT.

Dirt is seldom apparent to those who have grown accustomed to living with it all their lives; even they, however, fall prey to its many attendant evils.

Dirt in the cookhouse creates a danger to every man who is fed therefrom and to eliminate the possibilities of infection and the tracing of the outbreak of epidemics directly to unhygienic practises and conditions in the cookhouse both employers and cooks must be vigilantly on their guard to ensure that their canteen maintains a standard of scrupulous cleanliness.

COOK DEPUTY OF EMPLOYER: It's a headache—we know that—and a task that calls for constant watchfulness and supervision, but one which cannot and must not be disregarded. Every cook should regard himself as a deputy for his employer and assist in the suppression of unclean habits and the strict maintenance of hygienic observances.

DAILY INSPECTION: The supervisor should never fail to hold a daily inspection both in the dining hall and the cookhouse, not forgotting the outside area as well.

ASHES FOR CLEANING UTENSILS: Some are in the habit of using earth with which to clean cooking pots and pans—this is a very dangerous practice and one which must cease. Ashes may be used for this purpose with equally good results, but never earth which may be contaminated and fouled in a dozen or more ways. It should be insisted that the outside of every cooking utensil is kept as clean as possible—our aim must be the elimination of dirt wherever it may be.

HOT SOAPY WATER: When scrubbing down is being carried out it should be ensured that hot soapy water is used for this purpose. Cold, clear water is not effective for the removal of dirt and grease but it will be used unless this is authoritatively forbidden and its use personally prevented.

TABLES AND BENCHES: Tables and benches should be scrubbed down every day. Wiping them over with a damp cloth will never remove

dirt. This merely gives an appearance of cleanliness while the wood remains damp but immediately it is dry the accumulated filth can easily be detected in the crevices and on the surface. Insist on the use of a scrubbing brush and plenty of hot soapy water. Have a look underneath the tables—dirt corrodes and is as potent an evil when it is visible as when it is not. See that tables and benches are regularly cleaned underneath by having a frequent "field-day" during which they are reversed and scrubbed.

Keep equipment clean and this includes the small, apparently insignificent utensils. Knives with grimy handles, corroded with grease, are both offensive and highly dangerous. In this climate germs thrive anywhere but nowhere better than in accumulated dirt. Clean hands and dirty knife-handles are futile combination.

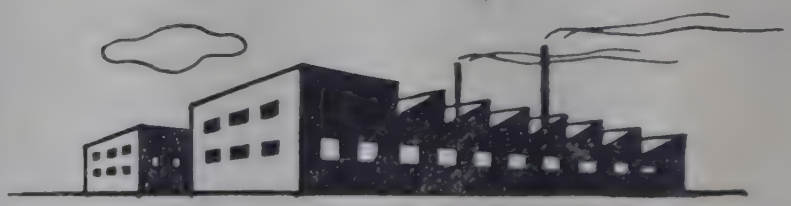
DIRT AND ODOUR INSEPARABLE CHUMS: See that the insides of ovens are kept clean; have them scrubbed out regularly; and swill-bins, too—how often are they washed out with a strong solution of disinfectant? Dirt and odour are inseparable chums—sever the friendship and eradicate the smells hardly compatible with the aroma one anticipates from a place where food is being cooked.

VEGETABLE STORES: The vegetable store must not be overlooked. If vegetables are allowed remain in sacks the rotting items will soon cause contamination. Tip them out of the sacks, discard decaying items, and avoid both waste and odour.

WAR AGAINST DIRT: *Clean hands and clean clothes*—insist on both. Who is going to relish a meal served up by an individual who personifies filth. The war is against dirt; in the individual as well as the cookhouse. The enemy is dirt—seek it, find it, and destroy it.

We are certain that many of our cooks remark as they read this that the conditions herein outlined and deplored do not apply to their own cookhouses—and these cooks are in the majority (we hope). To them we say:—'Keep up the good work, it pays high dividends, for there can be no higher reward in life than the self-earned satisfaction of a job well done. Those who disbelieve this have never put it to the test.

INDUSTRIAL CANTEENS IN AUSTRALIA



An Experiment in Central Planning. Marjorie G. Rouse.

(Reproduced from the Journal of the Industrial Welfare Society.)

The Australian experiment in industrial feeding during the war appear to be unique. It attempted centralised control and complete standardisation of the canteen or cafeteria service (as it is called there) by the Government for all workers in war industries. Taking Great Britain's example of a hot meal which would supply in that one meal one third of the daily requirements for adequate nutrition, the Government assumed the responsibility for providing the meal. Not only did the Government plan, build, and equip the cafeterias, it trained the key staff—canteen managers and supervisors, book-keepers and cooks. The special department created to do the job was called the Food Services Branch. A specialist staff was assembled of technical, professional and commercial people, all experienced in large-scale food service. This department was the manager of the Government's canteens and of its feeding programme in industry. The aim of the department was to provide a hot nutritious meal, of uniform standard, to war workers at their place of work anywhere in the Commonwealth. The workers catered for were in Government munition factories, in shipbuilding yards and naval establishments, on the waterfront and in the coal mines.

The story began quite early in the war when, having embarked on its industrial war programme, the Australian Government decided that suitable working conditions and proper feeding facilities for workers should be introduced.

The initial planning staff later became head office and the central administrative unit in Melbourne, with four area departments created to control directly the cafeterias in their particular section of the Commonwealth. These area offices, at Sydney, Melbourne, Adelaide, and Brisbane had the same technical staff as head office, i.e., an area controller, with the various specialist officers and their staff.

With the exception of the purchase of certain perishable foodstuffs—such as fresh vegetables and fruit—and the employment of lower grade cafeteria and kitchen personnel, the control of the factory food service was from the area office.

The main work of the original planning staff at head office and in the area offices has subsequently progressed to the enforcement of standards of food service, particularly of nutrition and hygiene.

STANDARDISED MENUS

The first job that set this new department was the feeding of munition workers. The problem given them to work out was the service of a hot meal, in twenty minutes, on all three shifts, at a cost which the worker could afford. Practically no facilities existed in industry for the service of a full hot meal and it was soon discovered that the building materials and the necessary plant and equipment were not available for the anticipated programme. So in addition to designing the kitchens and the cafeterias and developing a food service, special equipment had to be devised. It was expected that meat rationing would eliminate the supply of joints, and a standard menu consisting of: thick soup; a choice of three entrees; a choice of three sweets; a choice of three salads; potatoes and two vegetables; up to two slices of bread and butter, and tea or milk was decided on. In addition, limited light refreshments, sandwiches, ice cream, and fruit, were made available. The object of the department was, however, to encourage the hot meal. Knowing the type of food to be served, and armed with details as to the number of workers, and the extent to which meals could be staggered and rest-pauses encouraged, type plans for the kitchen and the cafeteria were drawn up. To solve the problem of quick service and to avoid preplating of food three principles were adopted. These were: pre-selling of meal tickets at standard "unit" prices; pre-selection of main course; and design of the cafeteria "race"—a word not easily translatable but roughly implying a hatch service on cafeteria lines. The average meal was broken down into units, and one unit ticket each was allotted to the soup and sweet, and two unit tickets to the main course. A special 1 d. ticket covered the tea. The price of each unit was tentatively fixed at 3½ d., or 1 sh. 2 d. for the complete meal. It was not a fixed price at

every factory as the unit had to be adjusted to meet local circumstances and food costs. In most government factories it was 1 sh. 2 d., while in others a 4 d. unit was decided upon and the full meal cost 1 s. 4 d. Workers could with this scheme, easily purchase a portion or the whole of the full meal. If the full meal was purchased, tea was free; otherwise it cost a 1 d. Bread and butter was supplied free with the main dish. the salad, or the soup. Unit tickets were pre-sold and the worker was encouraged to buy tickets ahead of requirements. Workers on entering the cafeteria proceeded direct to the cafeteria races, selected the meal and handed in the appropriate ticket. There was no handling of money and no calculation of change at the races, so that eleven workers per minute were served.

A race (in a large cafeteria it would be a double race) was reserved for each entree, and in addition supplied soup, the choice of all three sweets, and the bread and butter. Tray and cutlery were picked up at the entrance of the race. Considerable thought was given to the design of the race and to the serving equipment behind it. Efficiency and economy were the deciding factors in the design of equipment.

STAFF TRAINING

Nutritional principles governed the planning of the meal service. The dietitians in the Division, having given attention to the menu and to the original plans for the layout of the kitchen and messrooms, next surveyed the employment field. It was speedily found that the potential supply of canteen managers and cooks was very limited. Training schemes were thereupon organised. The canteen managers were selected on previous experience and given psychological tests to determine their suitability. In an intensive two months training course they were given lectures on accountancy, kitchen organisation and management, staff control, nutrition and menu-planning, and bulk cookery. A book of standard quantity recipes formed the basis of the cooks' training course. The training of both managers and cooks took place in technical colleges and in standard canteens. In one State a special kitchen was built at the technical college so that the training would be under standard working conditions. Trainees signed an agreement with the Commonwealth that, subject to successful completion of their training, they would accept employment in a canteen wherever a vacancy occurred. Later it became necessary to devise a training scheme for book-keepers.

CANTEEN COMMITTEES

It was early recognised that the workers should have their share in the management of the canteens. A constitution was drawn up to define the

function of the canteen advisory committees. Union representation was based on a simple formula which provided the appropriate representation of each union in the factory or the area. Workers could hold office, but representative of the area controller, the canteen managers, and the factory welfare officer were all eligible to attend meetings though they had no vote. The committee made proposals for improving the canteen service and was the medium through which workers were encouraged to take care of the canteen and equipment, to avoid waste of food and to help with efficient canteen function. The periodical trading and other financial statements were submitted to the committees, which were empowered to make suggestion to ensure that the service operated on a sound financial basis. If an increase in the price of the unit became necessary the committee dealt with the matter; they also assisted in the effective operation of tobacco and chocolate rationing schemes.

ACC. NO. 338
CLASS No. 640
23.1.81

GOVERNMENT FINANCE

The Government cafeterias were established for two purposes. Firstly, to provide employees with nutritious meals at reasonable prices, and secondly to demonstrate that this could be done on a practical basis, thus setting an example which other employers would find it hard to disregard. Under normal conditions it was possible to provide nutritious meals at a reasonable price on a self-supporting basis. Under the abnormal conditions of war, such as shift-work and overtime, operational expenses increased. The Treasury therefore decided that the Commonwealth would assist the cafeterias, and proceeded to provide completely equipped cafeterias for the use of workers, with competent management and an expert headquarters staff to ensure that the cafeterias had the benefit of the latest techniques and kept proper cafeteria accounts. Initially it was decided that the Government would pay up to 50% of the cafeteria wages in any factory. In practice, it was found that wages varied considerably, with the result that some factories were in a much better position than others, so the decision was taken to pay all wages of the cafeteria staff in excess of 17½%, and transport costs in excess of 1% of sales.

LIBRARY

Every encouragement and complete technical advice and assistance was given to employers in private industry to establish cafeterias, not only as a war-time service, but with a view to the post-war development of industrial feeding.

It is considered that as a result of this Government policy the principle of feeding at work is now established in Australia, and that insistence on feeding facilities will be increasingly provided for in the workers' awards. The works' cafeteria has been shown to be a very practical avenue for applied national nutrition, where nutrition education may be effected by example rather than by propaganda.

The Government of India wants to know the extent of feeding the workers in Canteens. Would employers of labour who have Canteens in their works, please have the required information,—similar in form to that set out below—sent on their letterhead to:—

a) The Government of India, Department of Food, New Delhi, with copies to :—

b) The Regional Food Commissioner.

c) The local Controller of Rationing.

"CANTEENS IN INDUSTRY"

1	2	3	4	5
Province or State	Name of Firm	Location of Works	Total number of Workers served with "MEALS" Weekly	What is the price the worker has to pay for a Meal

Signed.....

Position in Firm.....

Place and Date.....

NOTE: Further particulars regarding type of meals, photographs recipes, etc., will be welcomed.

Gay Decorations in a British Restaurant in a London Industrial area.

Vegetables

(Extract from an article on "DRIED FOODS" by Sir Joseph Barcroft, C.B.E., F.R.S., The Scottish Journal of Agriculture—July 1944)

VEGETABLES FOR CALORIES AND FOR VITAMINS

Vegetables may be divided into two categories: those which are eaten primarily as a source of calories and those which are eaten to provide vitamins. In the first category perhaps the potato is pre-eminent, and in the second the cabbage. Carrots and swedes come into both categories. All these vegetables can be dried, but it will suffice to consider the two typical ones.

PROBLEMS OF POTATO

The potato is in one respect like the egg; it is not feasible to dry a potato and reconstitute it "complete with skin". The largest units suitable for dehydration are about one inch and a half long and about the thickness of a pencil or rather less.

Like some other foods the potato presents a difficult problem of deterioration of colour during processing and drying. It is easy to dry potato strips, but unless special precautions are taken the strips emerge from the drier looking like small pieces of leather—dark in colour and not fit to be eaten. The change in colour (and this is also true of dried apple slices or rings) is due to an enzymic oxidation, and it can be prevented by a rapid pre-cooking which kills the offending ferment or enzyme. With suitable pre-cooking, strips can be

obtained which, even after blocking, make up to something quite comparable with strips from a fresh potato.

POTATO POWDER

Perhaps the most attractive product obtained by drying potato is a powder used for making mashed potato. Within the experience of the writer a mashed potato made from powder falls short in colour just a little, but the flavour is as good as that of a mash from fresh potatoes; its main attractiveness, however, is due to its extreme convenience. It is only necessary to take the requisite amount of potato powder, pour on the correct quantity of hot water, stirring the while, and the mashed potato is made. It is almost a matter of seconds.

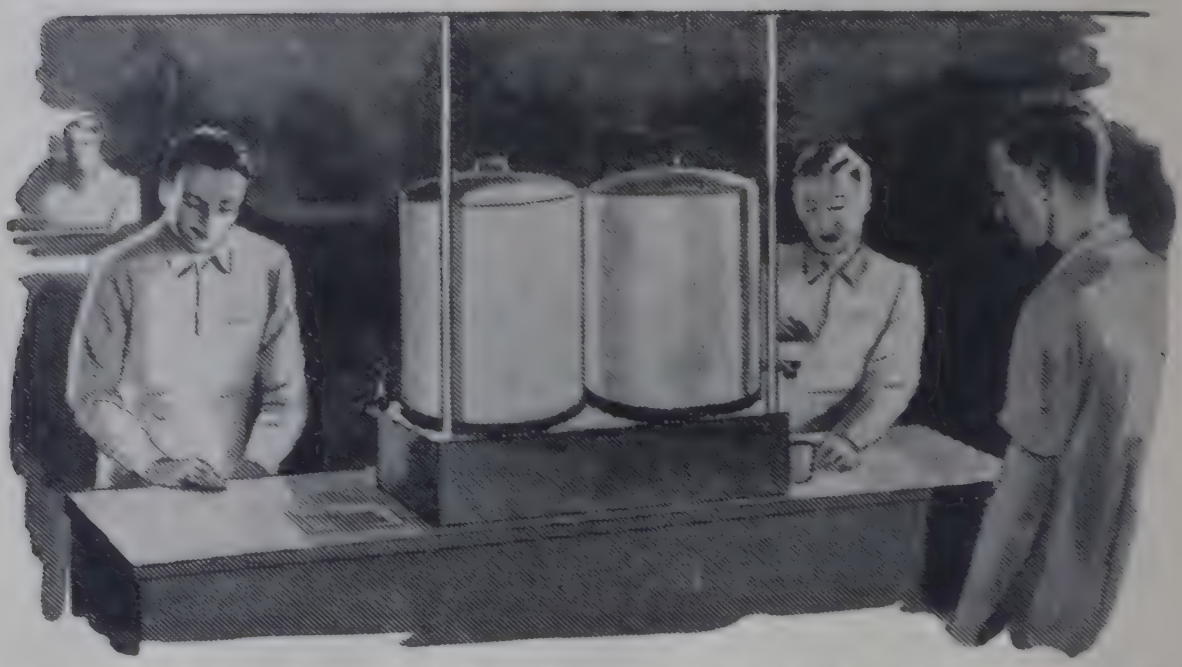
PROCESSING OF VEGETABLES

Here is another peg on which to hang a general principle. The processing of food must almost necessarily take place in the locality in which the food is produced, and as these islands contain great potato-producing areas, the possible dehydration of potato is of particular interest to Great Britain and Ireland. The important question therefore arises: What saving could be effected if much of the potato now put into clamps were to be dried instead and dried not for the purpose of making stock feed but for mashed potato at the dinner table?

PROBLEMS OF CABBAGES

To turn from potato to cabbage. This vegetable is perhaps the commodity which, when reconstituted, most nearly resembles the original from which it is made. A dish of cabbage made from the blocked dried material is just as good, or bad, as the cabbage from which it was made. The flavour is a little milder and the smell in the house is a little less oppressive—otherwise it is indistinguishable. And this may be said in favour of the dried cabbage: it is not so easy to spoil it in the cooking. Perhaps there is no better test than one which was applied in an Air Force canteen. Four hundred men were divided into batches of two hundred each. One batch was given cabbage of good quality and cooked in the ordinary way; the other, dried cabbage. Neither batch knew that an experiment of any kind was being carried out, but less cabbage was left on the plates of the batch served with cabbage from the dried material than on the plates of those served with fresh material, and vitamin C value of the cooked dried cabbage was somewhat higher than that of the cooked fresh cabbage. Here again the pre-cooking of the cabbage before its dehydration had in great measure stabilised the vitamin C so that less was lost in cooking than would otherwse have been the case.

TEA MAKING IN CANTEENS



A cup of tea is a service habit whatever be the kind or service one is engaged in. Battles are fought on the home front too and our workers in industrial canteens are fighting our battles for us just as much as our soldiers on the front are doing. The Indian worker appreciates his "Garam Chah" just as much as the British or Indian soldier does, and it is up to the employers to see that the labourers under their control get this much appreciated tea as good as it can be made.

The homely cup of tea is really the pivot of industrial catering. Those quick "penny-worths" do more than anything else to build up goodwill, and goodwill is conducive to good work. It is worthwhile making the tea served in industrial canteens taste good.

To make tea in large quantities demands knowledge, skill, and care but bulk tea can be made just as nice as tea made in teapots, and it is more economical giving a considerably larger number of cups to the public. But results depend on the tea maker, and there are certain quite simple, but quite definite rules which must be applied as much in the canteens as at the home. If they are, there will be no grousing about the quality of the tea, and no wastage.

The secrets if successful tea making are really not secrets at all—they are rules of commonsense that we have always known at home applied to larger numbers, and with different equipment. There are five golden rules to be observed in the making of good tea—really boiling water, proper infusion and sweetening, last moment addition of milk, cleanliness, correct storage.

ILING WATER

...ever be the method of heating, gas, electricity or steam and whatever ... equipment, the maximum gallonage required at one time should be ...fully worked out. It should be possible with proper planning to ...sure that the equipment provided will give ample supplies of freshly ...iled water at the moment it is required. Boilers should be filled up with ...ldly run water for each service, instead of new water being added to ... which has been already boiled. If that is impossible, the next best ... is for boilers to be drained out at the close of the day, and filled up ... with freshly drawn water in the morning.

NERAL DEPOSITS IN THE BOILER

...ning up" is noxious and needs washing. It smells boiling, and a ...ll piece of loofah or sponge, or a few smooth pebbles helps to collect ...e of the mineral deposits which accumulate round the inside of boiler. ...ey weakening of the kettle of the boiler, if got at daily with a hard brush, ...ps down but easily.

EANING OF UTENSILS

...ensils make a great deal of difference to the flavour and colour of ... Hard work and vapour need constant supervision. Milk and tea ... deposits which, if not dealt with regularly as in any other food ...ils accumulate and spoil the brew. Hot water, a clean cloth, and ...d rubbing are the only safe cleaners. Abrasive powders and materials, ...e wire wool, and sand should never be used. They wear away ves... ...s and affect flavour. Soda is in the same class.

When not in use urns should be stored upside down, tilted on the lids, ...llow a current of air to circulate.

Cups and vessels used in the canteens should be kept scrupulously ...n. Badly cracked or chipped cups are liable to be carriers of infection, ...y should be promptly replaced. Used vessels should be sterilised by ...ing them in a pail of water to which a little chloride of lime has been ...ed. Some people like to pile tea, sugar and milk into pot or urn and ...r for the beer. They add further water as needed till served tea is no ...ger bearable, if it ever was.

FUSION

...sion is a very important factor in tea making. Anything less than ... minutes means that a large proportion of the goodness of tea will be ...n away while the tea will be weak. For large scale tea making a ...e muslin tea bag should be used for infusion, loosely tied to allow the ...s to swell to about three times their size. The life of a muslin bag

is not very long but it can be prolonged by soaking it in cold water overnight. This will keep the bag sweet, too, but it must be dried before tea is put into it again.

MILK AT THE LAST MOMENT

Tea and milk do not combine permanently, kept for even half an hour with milk in, tea changes from a golden brown to a dark unpleasant colour. The golden rule is to add milk at the last possible moment before service. Tinned milk is much maligned and black colour is often blamed on to it, quite wrongly. Any milk, fresh or tinned, has the same effect on tea kept a long time. If tinned milk is used, it is best to mix it in the proportion two-thirds fresh milk to one-third dry. Like fresh milk, tinned and dried milk must be added at the very last moment.

SWEETENING OF TEA

Rationing makes it impracticable to sweeten the individual cup, and sugar has to be used to full advantage. The only satisfactory method of sweetening is to add sugar after infusion and after removing the tea bag; stir well until completely dissolved in the urn. In this way the full sweetness is absorbed into the tea.

STORAGE OF TEALEAVES

The last secret of good tea, but by no means the least, is keeping the dry leaf in good condition. Storage needs thought. Tea is a sensitive plant —not a manufactured product. Chinese tradition says that the leaves should 'unfold like mist rising out of a ravine, and soften gently like fine earth swept by rain'. This is what should happen during infusion, but not before. Being very sensitive to damp, the leaf quickly absorbs moisture from the atmosphere, and, with the moisture, any odours from strong-smelling commodities stored near. These are the rules of storage :

1. **Keep tea in a cool dry place, away from draughts, hot pipes and strongly-smelling goods like soap, fruit, cheese, spices and disinfectants. If space allows, have a small separate tea-storage section.**

2. **Use metal bins or wooden chests, with tightly closing lids, and on no account keep tea packets loose on shelves.**

3. **If wooden chests are used, they should be away from walls, and have a couple of pieces of wood underneath to keep them off the floor, out of reach of damp and scrubbing. This allows a free current of air under and around. (Strong disinfectant should never be used in cleaning out the store).**

Tea should always be used in rotation, new supplies not being drawn on till the old are finished.

These rules kept in mind and carefully observed ensure to the worker that which he likes so much daily—ration of good tea.

RECIPES

MUTTON PULAO

INGREDIENTS : (*For* 100 *men*) *Rice* 10 *seers, Mutton* 5 *seers, Ghee* 1½ *seers, Garlic* ¼ *seer, Ginger* ¼ *seer, Salt, Pepper, and Cinnamon to taste.* METHOD : Cut the mutton into small pieces and wash well in clear cold water, put into a pan with half a pound of chopped garlic and half a pound of finely sliced ginger with sufficient cold water to well cover; allow to simmer until the meat becomes tender. Chop the onions and fry in ghee until they are a nice golden brown. Pick over the rice and remove all foreign matter, wash well in cold water and after allowing it to soak for half an hour in cold water drain off; add the rice to the onions and ghee adding ground pepper and well-brown cinnamon to taste; fry for about 10 minutes. The meat should be taken out of the gravy and put into the rice and onions whilst they are frying, salt should also be added at this stage. Next add the gravy in which the meat was cooked to the pulao. This will probably be found insufficient to cook the rice and small quantities of water may need to be added from time to time. When a single grain of the rice feels soft when pressed between the forefinger and thumb and all the moisture has been absorbed, the pulao is ready.

A very low fire is needed to cook the pulao after the addition of the gravy and the pan should be kept covered constantly after this stage, except while stirring, or when necessary to add a little more water.

PEA PULAO

INGREDIENTS : *Rice* 10 *seers. Fresh Peas* 3 *seers, Ghee* 2½ *seers, Cardamoms* (*whole*) 2 *oz., onions* 2½ *seers, Red Chillies* (Ground) 4 *ozs., Bay leaves* 2 *ozs., Cloves* (*whole*) 4 *ozs., Cinnamon* (*broken into small pieces*) *are required.* METHOD : Pick and clean the rice, wash well in cold water and

allow to soak for half an hour, chop the onions and fry the ghee to a golden brown, add the ground chillies, bay leaves cloves, cardamoms, and cinnamon, and fry for a few minutes longer turning over with a spoon to prevent burning. Add the rice and the shelled peas, together with salt to taste and four gallons of boiling water. Cover the pan and cook gently over a low fire stirring now and then. It may be necessary to add a little more water if the rice is not fully cooked by the time all the water has been absorbed.

NOTE:— Keep the lid on the pan except when necessary to remove it for stirring the rice to prevent burning, otherwise the water will evaporate, and escape as steam instead of being absorbed by the rice.

SIMPLE PULAO (MUTTON)

INGREDIENTS: (*for* 100 *Men*) *Rice* 12½ *seers, Mutton* (*sliced*) 6 *seers, Onions* (*chopped*) 6 *seers, Ghee* 2½ *seers, Curry Powder and Salt to taste. Sultanas and Nuts if available.*
METHOD: Fry the onions for a few minutes in ghee, and the Curry Powder and then the meat, fry for a few minutes longer, put in enough cold water to three-quarters cover the meat, bring to the boil and simmer gently in closed pan. Boil the rice as in recipe No. 1 and when ready add the meat and gravy. Heat through and mix in the nuts and sultanas which should be previously fried off in ghee.

MUTTON PULAO — USING CURRY POWDER

INGREDIENTS: *Rice* 25 *seers, Ghee* 5 *seers, Mutton* 6¼ *seers, Salt* 1½ *seers, Onions* 5 *seers, Condiments to taste.* METHOD: Clean and well wash the rice, leave in soak for one hour, wash the mutton, and cut into small pieces, sweat 1½ seers of onions in a little ghee, add the condiments fry for a few moments and then add the meat continuing to fry until the meat begins to colour. Add four gallons of water to the meat, onions and condiments, bring to the boil and then simmer until the meat is tender. Place the remaining chopped onions with the rest of the ghee and brown, then add the drained rice and fry well. When the rice is nicely fried add the mutton and the stock with salt, no additional water is required. Keep the pan covered and cook very gently over a low fire. The rice should be soft by the time all the liquid has been absorbed. When the rice is cooked put some atta paste round the lid of the degchie to prevent the steam escaping, remove the fire allow to remain until the rice is set.

CURRIES (MEAT)

MADRAS CURRY

INGREDIENTS : *For each seer of mutton grind the following massala: a quarter-teaspoonful of jeera, half a teaspoonful of kus-kus, four dry chillies, six cloves of garlic, one inch of turmeric, and half-a-teaspoonful of mustard seed.*

METHOD : Brown well a sliced onion in a tablespoonful of ghee, add the curry stuff and mix well, then add the meat (which should be cut into pieces of suitable size) sweat for a few minutes, add half pint of water, sliced green ginger, chopped green chillies and chopped coriander leaves (dhania) as much as will fill a tablespoon, salt to taste and simmer gently over a very low fire. Continue to simmer until the meat becomes tender and the ghee floats on the top of the curry. It will then be ready to serve.

JEWISH CURRY

INGREDIENTS : *For each seer of meat grind the following massala:—One tablespoonful of coriander seed (dhania), four inches of turmeric, one tablespoonful of black pepper, three ounces of garlic and four dry chillies.*

METHOD : Cut the meat into small pieces, slice an onion and fry in two tablespoonful of ghee, until well-browned, add the massala and cook for a few minutes, pour in one ½ tea cup of vinegar and then add the meat with a small quantity of water with salt to taste, cover the pan and simmer until the meat is tender. Stir gently from time to time.

FOOGATHS

FOOGATH OF RAW PLANTAINS

INGREDIENTS : *For each portion allow 2 small plantains, one dry chilli a quarter of an inch of turmeric, half a saltspoon of jeera, half a green chilli, two cloves of garlic, half an onion and a quarter of a coconut.*

METHOD : Slice the onion and brown in a tablespoonful of ghee, grind and mix all the massala except the coconut which should be flaked and kept separately, add the massala to the onion and ghee already in the pan, remove the green portion of the fruit, cut into slices and add to the pan, stir gently, cover the pan and simmer over a slow fire until the fruit softens, then add the salt to taste and the flaked coconut, stirring very gently so as not to mash. Cook very gently for ten minutes longer.

FOOGATH OF WHITE PUMPKIN

INGREDIENTS: *Allow 3 chataks of pumpkin for each portion, ½ inch of green ginger, 2 cloves of garlic, 1 green chilli, half an onion and a quarter of a coconut if available.* METHOD: Slice the onion and fry in ghee or oil, cut the vegetable into 1 inch cubes and boil with the ginger (sliced) and the ground massala in very little water in a covered pan until almost cooked. Add the vegetable and massala with salt to taste and the coconut (which should be previously flaked), to the onions and ghee, simmer for just a few minutes only.

NOTE:— Vegetable marrow foogath is prepared in a similar manner.

CHAPPATTIES: (VARIOUS)

CHAPPATTIES (SIMPLE)

INGREDIENTS: *Allow ½ seer of Atta for each seven or eight chappatties, also one teaspoon of salt.* METHOD: Place the atta in a bowler kneading through and make a bay (hole) in the centre, throw in the salt, add water little by little mixing the while until a dough is formed, not too stiff but it must not be slack. Knead well, cover, and leave for half an hour then knead again. Sprinkle a pastry board with atta (atta for this purpose should be well sifted) break off a piece of the dough size of a tennis ball or slightly smaller and roll into a ball, then place on the pastry board and roll out quite thin. Continue this process until all the dough is made into flat cakes. The chappattis should then be cooked through on a hot tava. Spread a teaspoon of ghee on each whilst hot and serve at once.

CHAPPATTIES (ANOTHER METHOD)

INGREDIENTS: *Allow ½ seer of atta and one teaspoon of salt for each eight or nine chappatties.* METHOD: Make a dough as for Chappatties simple, above, but the dough should be very slightly slacker in this case, cover the dough with a wet cloth and leave for three-quarters of an hour. Dip the hands in dry atta and break off pieces of dough slightly smaller than in the previous recipe and roll between the hands, press out into thin round cakes and bake on an iron plate.

SWEET DISHES

HALVA

INGREDIENTS: *To prepare this sweetmeat equal quantities by weight of the following are required:—Atta, sugar, and ghee.* METHOD: Warm the ghee in a pan, add the ghee and fry gently until the atta

had become lightly browned, boil the sugar in double its weight of water until it becomes a thin syrup, add this syrup to the atta and ghee and cook gently over a very low fire stirring all the time. When the atta has absorbed all the syrup it should be removed from the fire and rolled out to about 1 inch thickness on a slightly greased iron plate.

NOTE:—Cinnamon may be added to the syrup as a flavouring if desired but the syrup should in this case be strained before mixing with the atta to remove the pieces of cinnamon. Almond kernels, Pistachio kernels, or Cashew nuts may also be put into the halva if liked, nuts should be put in just before the halva is removed from fire. When cold the Halva should be cut into squares.

COCONUT TOFFEE

INGREDIENTS : *The following proportions of are required for this sweetmeat:— 2 lbs. of Jaggery 2 or 3 fresh coconuts.* METHOD : Flake the fresh of the coconuts saving the water from one of them. Mix the water of one coconut with the jaggery into a syrup, add the flake coconut and boil the mixture over a slow fire until it can be formed into stiff balls. Arrange on greased plates and allow to cool.

NOTE:— Do not handle the boiling mixture with the fingers otherwise severe burns and blisters will result.

VEGETABLE HOT POT

INGREDIENTS : *2½ seers Dried Pulse, 17½ seers Mixed Vegetables, 2½ seers Onions, 5 seers Potatoes, Mixed Herbs (if available).* METHOD : Wash and soak the pulse overnight. Prepare and slice the vegetables, except green vegetables which should be shredded, and slice the onions. Mix together, sprinkle in the herbs, and put in greased dishes.

Slice the potatoes. Spread them in a neat layer on top of the mixed vegetables.

Barely cover the whole with stock, dot the top with margarine, bring to the boil, place in a hot oven and cook until all ingredients are tender. The top will need protection during part of the cooking process to prevent it becoming too known. This may be done by means of a lid or grease-proof paper which may be found in the bacon tins.

Serve with boiled potatoes.

TOMATO KETCHUP

INGREDIENTS : *5 seers Tomatoes, 1 cup of Vinegar, 3 Teaspoonful of salt.* METHOD: Wash the tomatoes and cut into pieces and then cook with the onion and garlic for half-an-hour. Rub through a serve and then cook again slightly thickened watching the mixture carefully and occasionally stirring. Add the vinegar, sugar, salt, mustard and spices (spices must be in a small bag). Continue cooking and keep stirring until the correct consistency has been obtained.

The sauce should be bottled when warm and not while it is still hot.

NOTE:— Do not put in too much water in the initial stage of preparation. The tomatoes should only be covered.

FOOD CANTEENS IN GOVERNMENT UNDERTAKINGS IN THE UNITED PROVINCES

INTRODUCTION

Many systems have their faults and, sometimes, advantages, too. And wars, whether they be necessary or unnecessary evils, do spur men into action, so that the instinct of self-preservation, if nothing else, prompts the invention and introduction of new novel systems and institutions for the general well-being.

CANTEENS—THEIR TRIAL—AND UTILITY

As a result of the present war the food-canteen idea has appealed to and taken firm root in the minds of people in most Western Countries—particularly in the United Kingdom and America. Their successful working in those countries urged us here in India to set up such food canteens in industrial concerns and advance the physical and mental well-being of all workers, and their general efficiency in work. Ultimately these are sure to make for the satisfaction and prosperity of the employers as well.

FOOD CANTEENS IN THE U.P.—NO. OF FACTORIES, ETC.

In the United Provinces and Rampur State there are 25 large Central Government factories, workshops and depots. In each of these there are 1,000 or more workers, and it is for the benefit of these that sixteen clean and attractive food-canteens have been set up, some with the help of the Indian Tea Market Expansion Board, although most of them are now departmentally managed.

VENDORS-FOR-CANTEENS

At two of these, as there is no space for erecting a building for a canteen, foodstuffs are brought by vendors during the lunch intervals and sold to

the workers after being inspected by responsible medical officers. However, this cannot be said to be a very satisfactory arrangement although it must be admitted that something is perhaps better than nothing.

In four canteens chappatties are sold at 2 pice or less each; at one place 6 chappatties made from pure wheat atta are sold for 1 anna, and 36 such chappatis are made out of 1 seer of atta. Also 1 chattak of cooked vegetables is available for 2 pice. At another place 30 chappaties made out of 1 seer of pure wheat atta are sold at 2 pice each with dal which is supplied free. And at yet another canteen chappaties and dal are sold at 1 pice each and 1 pice per cup respectively. Hence a meal consisting of 8 chappatis (or a plate of rice) 1 cup dal and a quarter plate of vegetable curry may be had for 3 as.

WORKERS' APATHY

In some areas apathy on the part of workers towards canteens may in a large measure be due to their being indifferent and illiterate, also the cost per meal being still high in comparison with the average wages of the workers which are about Re. 1/– per day. All this may be due to the lack of any energetic and systematic propaganda to make the workers canteen-minded, and to a failure to provide good, cleanly served food, at inexpensive prices.

PROPAGANDA

It is, therefore, evident that while cooked-food canteens in industrial concerns are in the long run really beneficial to employers and employees alike, it is up to all responsible individuals to indulge in simple but regular and persistent propaganda, broadcasts by means of Hindi and Urdu placards and other devices, to stress the need for wholesome and well-balanced diets during mid-day intervals. Once this is done and the workers become truly canteen-minded the working cost, and also the cost per meal, in a cooked-food canteen are bound to be low and within the reach of all.

INDUSTRIALISTS —

Do you know that your Food Rationing Authority will issue Permits for Rationed foods to be served as cooked meals in an approved Canteen?

This concession is in addition to any supplementary rations given to Heavy Manual Workers.

LECTURES ON NUTRITION AT THE NUTRITION RESEARCH LABORATORIES

COONOOR

Two courses of lectures on Nutrition were held in July at the Pasteur Institute Buildings, Coonoor under the direction of Dr. W. R. Aykroyd, C.B.E., Sc.D., M.D., Director of Nutrition Research. The main object of these lectures was to assist Senior officers of the Food Departments and other Departments of Provinces and States to have a wider knowledge of the science of "Nutrition", and to study practical ways and means of improving "Nutrition" of the people generally. The lectures gave an opportunity to these officers to meet and discuss Government plans for improvement of the diet of the people. The syllabus was comprehensive and included lectures and discussions on the following subjects :—

1. General. The history of the development of the science of Nutrition. Its public health and social importance.
2. Calories, proteins, carbohydrates and fats.
3. Minerals and vitamins.
4. The nutritive value of Indian foods.
5. Dietary standards and requirements.
6. Diet surveys.
7. Nutrition and Public Health.
8. Deficiency diseases.
9. Population and nutrition.
10. Economic aspects of nutrition.
11. Famine (its history in India up to and including the Bengal famine).
12. Specific measures for improving nutrition (School feeding, milk schemes, propaganda, canteens, use of synthetic vitamins and vitamin concentrates, etc., etc.
13. Nutrition, agriculture and food supply.
14. Food policy in India.

By Dr. M. M. Shaffi, Honorary Medical Officer-in-charge, Nutrition Section, War Services Exhibition, Government of India, Department of Information and Broadcasting.

One can scarcely approach more intimately the life of a people than by studying the diseases and mishaps that affect their daily food and health. The first problem the community as a whole has to solve is that of providing itself with food. The community that enjoys a well-balanced diet is going to be the most-fitted to stand up to trials and battles of modern life. In other words the better the nation's Nutrition the better the health and the less burden on other public services.

Diet 'experts' now hold the view that a truly incredible portion of the inhabitants of this globe are under-nourished or mal-nourished. If agriculturists could produce more cereals milk, vegetables, fruits and such commodities useful to the maintenance of health, the problem of life would be considerably eased.

There is a strange un-spoken sympathy which has grown up between diet experts and the common people.

The Australian Prime Minister at the League of Nations in 1935 expressed the position very clearly—"It would be a great blessing when the marriage of Agriculture and Nutrition takes place in earnest". The Radical Problem in India, as in all other countries at present, is shortage of food. It urgently calls for agricultural re-orientation and development to produce more food, especially food of a protective and nutritive nature.

There is no doubt that the diet of the greater part of the population of the world today is unsatisfactory. It is scarcely an exaggeration to say that the food production of the world could be increased considerably if nature's resources were exploited and the growing scientific knowledge used more fully and intelligently.

The state should aim at organising the nutrition of the people according to the laws of physiology and forms of hygiene. Whatever his income

each individual should have food that is conducive to maximum health and physical fitness, so that his capacity for work and his general well-being are maintained. Supply of right food is a public service like other services. If a country were taught to produce from its soil all that it requires to maintain the physical efficiency of its population, it would solve one of the greatest of modern problems.

Modern views on human food requirements are based on scientific research. All food that is consumed and assimilated by the body with small exceptions provides the body with energy, warmth and promotes growth.

Scientists have coined a term for a convenient unit for the heat energy that makes the human engine function properly throughout the day and night. This unit is termed a calorie. They have calculated that the calories required by each individual to maintain energy, warmth and growth range from 2,600 to over 3,000. This indicates the amount of heat required for maintaining normal body temperature during twenty-four hours, the energy required for the working of the heart and of the chest muscles during respiration, the movements of the intestines for digestion and secretion of the digestive fluids and for the maintenance of that mysterious process called "life". 2,600 calories are the minimum requirements of the human body in a state of normal health.

Over and above this, there are various other important factors that stabilise the function of the human body.

The food crisis during the present emergency is largely due to unusual conditions arising out of the War. Various Governments are trying, and have succeeded to some extent, to solve the problems arising out of these extraordinary conditions.

We are concerned with India where the situation has probably been tackled rather late. Even in normal times the Food and Nutrition situation in India was not satisfactory. We realise these deficiencies now and our main problem is as to what should be the food situation in India when normal conditions return after the war.

We have to consider and cope with problems relating to Food and Nutrition and each one has to be solved in a manner beneficial to the people of the country. These are intimately related to other problems, those in Education, Population, Agriculture, Public Health, Economics, Child Welfare and other subjects which have to be considered. If we deal with these collectively at least some of our difficulties will be solved. Before I close this I should like to emphasize the necessity of educating the people to make the best use of available commodities to improve their nutrition, thereby becoming an Al Nation.

We hope to place before you now and then our suggestions and to invite your criticism of these suggestions but we expect co-operation in every sphere of activity which has an influence upon the improvement of the nutrition of the teeming millions in India whose welfare is our goal.

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A message to Industrialists

R.B.A.N.M's High School LIBRARY

flowers or FOOD?

There is probably an appreciable area of ground around your buildings which can be turned into small gardens for the growing of vegetables or fruit. Perhaps some of it has already been made into a flower garden, and can be converted.

Bananas, onions and potatoes will grow almost anywhere, and most green vegetables need only a little attention. Start now to transform your waste areas to produce for your Canteen.

INDUSTRIALISTS!

grow more FOOD

BUILD INDIA'S HOME AND PEACE FRONT